

GAO

Report to the Chairman, Subcommittee
on Defense, Committee on
Appropriations, U.S. Senate

September 1991

DEFENSE AGAINST NUCLEAR WEAPONS

Coordinated Strategy Needed Between SDI and Air Defense Initiative



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Abstract: This is an inventory of nonproliferation and nuclear threat reduction activities. The inventory looks at all DOE programs that fall into 10 categories. They include the security of nuclear materials and expertise in the former Soviet Union. The report covers related work funded by other agencies, but conducted at DoE labs. The report can be found on the internet at <<[<http://www.nn.doe.gov/nn>](http://www.nn.doe.gov/nn)>>.

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National Security and
International Affairs Division

B-223094

September 24, 1991

The Honorable Daniel K. Inouye
Chairman, Subcommittee on Defense
Committee on Appropriations
United States Senate

Dear Mr. Chairman:

In response to your May 2, 1990, letter, we reviewed selected aspects of the Air Defense Initiative (ADI) program. Our objectives were to (1) provide information on whether the Department of Defense (DOD) has refocused the ADI program on the basis of the changed Soviet threat and (2) compare the ADI program's funding and schedule with those of the Strategic Defense Initiative (SDI), a companion program.

Background

In 1985 President Reagan ordered the creation of the ADI program, which is managed by the Office of the Secretary of Defense and is executed by the Air Force, Army, Navy, and Defense Advanced Research Projects Agency. In 1983 he had ordered the creation of the SDI program, which is managed by the Strategic Defense Initiative Organization (SDIO).

The ADI and SDI programs were intended to develop an architecture and the technology to address a massive Soviet nuclear attack on the continental United States. The ADI program addresses the threat posed by Soviet cruise missiles¹ delivered by long-range bombers and submarines and long-range bombers carrying bombs and short-range attack missiles. The SDI program counters the threat of Soviet intercontinental ballistic missiles and submarine-launched ballistic missiles.

As a result of recent changes in the Soviet threat, President Bush announced on January 29, 1991, that he had refocused the SDI program from deterrence against a massive attack from the Soviet Union to protection against an accidental or unauthorized attack by ballistic missiles from any geographic location.

In accordance with the President's direction, SDIO dropped the architecture it had adopted in 1987, called Phase I, which would have enhanced deterrence of a massive Soviet attack, and replaced it with a new architecture, called Global Protection Against Limited Strikes (GPALS). GPALS is

¹Technical terms are defined in the glossary.

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focused on global protection against accidental or unauthorized limited ballistic missile attacks as well as attacks from Third World tactical missiles. If the need arises, GPALS could serve as a technical foundation for Phase I, according to DOD officials.

DOD said it is currently refocusing the ADI program to provide similar protection against threats that SDIO's GPALS does not address, such as cruise missiles and long-range bombers.

According to DOD, if the United States decides it needs comprehensive limited protection, a combination of both SDI and ADI defensive systems will be needed. Table 1 shows the different Soviet threats that SDI and ADI are to provide protection against.

Table 1: Defensive Systems Proposed for Comprehensive Protection Against Accidental Launch

Category		
DOD protection programs		
Program name	Strategic Defense Initiative (GPALS)	Air Defense Initiative
Soviet threats countered	Submarine-launched ballistic missiles	Air-launched cruise missiles carried on long-range bombers
	Ground-based intercontinental ballistic missiles	Sea-launched cruise missiles carried on submarines
	Third World tactical missiles	Long-range bombers carrying short-range attack missiles and bombs

Results in Brief

Recent policy decisions to provide protection against limited strikes, combined with the projected decrease in numbers of ballistic missiles and the increase in cruise missile systems by the late 1990s, suggest that the SDI and ADI programs should be closely linked. However, these programs appear to be proceeding independently and on different schedules. Although the ADI program is being refocused on both defending the United States against a limited cruise missile attack and defending U.S. and allied forces deployed in a regional theater of operations, an architecture has not yet been defined, and therefore a cost estimate is not yet available. SDIO currently estimates that GPALS will cost \$46 billion (in fiscal year 1991 dollars), of which SDIO has funded only \$1.8 billion through fiscal year 1991.

Both the ADI and SDI architectures are scheduled to reach full-scale development and production by the late 1990s. However, the ADI schedule is years behind the GPALS schedule. SDIO estimates that some parts of GPALS will enter full-scale development in fiscal year 1993. For

fiscal years 1992 and 1993, DOD's funding request of \$589 million for ADI is only 6 percent of its \$9.5 billion request for SDI. The funding difference between the programs indicates that ADI will fall further behind SDI in the coming years.

When the programs were focused on providing deterrence, these funding and schedule differences did not appear to present a problem, since the U.S. offensive strategic forces provided sufficient deterrence to stop the Soviet Union from launching a nuclear attack on the United States with either ballistic or cruise missiles. However, now that the programs are focused on providing protection, both systems will be necessary if the Congress decides that comprehensive protection is needed. Program officials in the Office of the Secretary of Defense agreed that closer coordination and planning is required to ensure the most cost-effective approach to acquiring SDI and ADI systems.

Soviets Will Have Relatively Fewer Ballistic Missiles and Relatively More Cruise Missiles in Late 1990s

Until recently, the Soviet nuclear weapons threat against the continental United States was the primary focus of the ADI and SDI programs. Table 2 shows that the current number of nuclear warheads on strategic missile delivery systems comprising this threat differs significantly from the number proposed for the late 1990s, when SDI and ADI systems are scheduled to reach full-scale development and production. The development and production of nuclear weapons delivered by cruise missiles occurred after that of ballistic missile systems, and these weapons currently represent a small portion of the Soviet Union's nuclear weapons arsenal. However, the Soviet Union's number of cruise missiles, bombs, and short-range attack missiles is expected to increase over the next several years from 13 to 39 percent of the total.

Table 2: Current and Proposed Levels for Soviet Nuclear Warheads Delivered by Soviet Strategic Systems

Strategic systems	Current levels		Post-START levels	
	Number	Percent	Number	Percent
Limited protection provided by GPALS against Soviet				
ICBMs	6,595		3,028	
SLBMs	2,810		1,872	
Subtotal	9,405	87	4,900	61
Limited protection provided by ADI against Soviet				
Bombs and SRAMs	636		960	
ALCMs	680		1,300	
SLCMs	100		880	
Subtotal	1,416	13	3,140	39
Total	10,821	100	8,040	100

Note: ICBM, intercontinental ballistic missile; START, Strategic Arms Reduction Talks; SLBM, submarine-launched ballistic missile; SRAM, short-range attack missile; ALCM, air-launched cruise missile; SLCM, sea-launched cruise missile.

The number of nuclear warheads for each strategic system was provided by the Arms Control Association.

Congressional Research Service data generally agreed with the Arms Control Association's figures. Depending on the assumptions used for weapons loading for bombers, the totals for bombs and short-range attack missiles and for air-launched cruise missiles will vary slightly. Official DOD data on the number of nuclear warheads is classified.

In addition, SDIO's GPALS system is being designed to defeat tactical and theater ballistic missiles. Threat projections indicate that by the year 2000, at least 24 developing nations will possess ballistic missiles; 9 of these nations either have or are near to acquiring nuclear capabilities.

DOD Lacks an Architecture for ADI

The Office of the Secretary of Defense has not yet developed an initial ADI baseline architecture. Four architecture contracts, totaling about \$3.6 million, were completed in 1988 and produced a number of potential architectures. The Office planned to pick a baseline architecture in 1989 but did not do so.

Program officials told us that they are exploring strategic as well as theater uses for ADI and intend the ADI focus to be consistent with the GPALS concept. The Office is planning to develop an initial architecture

for the refocused program, but it has not stated when the architecture will be completed. ADI program officials told us that they plan to address issues concerning the integration of ADI with current SDI missile defense system concepts.

SDI architecture is proceeding independently of ADI. The SDI program has developed an initial architecture for GPALS and has a major architecture integration study underway to refine it. The SDIO group defining GPALS threat scenarios told us that it does not intend to look at the cruise missile threat.

ADI and SDI Funding

DOD has received \$538.6 million for research and development since the ADI program was first funded in 1987. However, the SDI program has received about \$21 billion for research and development since it was first funded in 1985. Table 3 summarizes ADI and SDI program funding by fiscal year, as provided to us by DOD.

Table 3: ADI and SDI Appropriations

Dollars in millions		
Fiscal year	ADI	SDI
1985	\$0	\$1,397.8
1986	0	2,675.1
1987	32.9	3,279.7
1988	49.2	3,553.1
1989	158.6	3,627.4
1990	149.9	3,571.2
1991	148.0	2,862.5
Total	\$538.6	\$20,966.8

For fiscal years 1992 and 1993, DOD's budget requests for ADI totaled \$589 million, whereas SDI's totaled \$9.5 billion, as shown in table 4. However, until ADI can estimate the costs of developing and acquiring needed systems based on a system architecture, it is impossible to determine how much additional funding is necessary.

Table 4: ADI and SDI Budget Requests for Fiscal Years 1992 and 1993

Dollars in millions		
Fiscal year	ADI	SDI
1992	\$273.0	\$4,572.6
1993	316.0	4,933.2
Total	\$589.0	\$9,505.8

ADI program officials developed a new program plan, which was reviewed by the Deputy Secretary of Defense in February 1991, that supercedes the original 1987 plan. This new plan covers funding levels for fiscal years 1991 through 1997 (see app. I). It prioritizes the ADI projects to be funded in the event of a reduction in funding. Funding for full-scale development and production is not included in the plan, since the services will be responsible for providing funding for these milestones.

The DOD Future Years Defense Plan for fiscal years 1994 through 1997 contains \$30 billion for SDI but no funding for ADI. However, DOD has informed the Congress that it plans to transfer sufficient funds from other DOD programs to fund the ADI program for the amounts indicated in the new program plan. Even though the services are to fund the full-scale development and acquisition of ADI systems, none of the services have budgeted resources for future full-scale development and production efforts.

ADI and SDI Schedules

As currently planned, SDI will develop at a much faster pace than ADI. Originally, ADI program development was intended to catch up to the SDI program and proceed through development and production at the same rate as SDI.

ADI program officials said that a Defense Acquisition Board review has not been scheduled to approve ADI entering the demonstration and validation phase, which SDI has been in since 1987. Since ADI will be comprised of different systems, DOD anticipates that the various systems will need to be approved separately for demonstration and validation. Approval for full-scale development is planned for the mid- to late 1990s, when initial systems and technologies selected for full-scale development will be managed by the services.

However, SDIO plans to proceed at a much faster pace for its GPALS theater defense systems. SDIO has requested

- fiscal year 1992 funding for full-scale development and production of improvements to the operational Patriot system, which will upgrade the existing system;
- fiscal year 1993 funding for full-scale development and production of the Theater High Altitude Area Defense system; and
- fiscal year 1993 full-scale development funding for the Extended Range Interceptor system and the Advanced Contingency Theater Sensor.

SDIO also plans to request fiscal year 1995 funding for full-scale development for the other two GPALS segments: Brilliant Pebbles and ground-based defense of the United States.

Recommendation

Considering the recent refocus on protection against accidental or unauthorized attack by ballistic missiles, cruise missiles, and bombers, we recommend that DOD provide the Congress with its recommendation for a strategy for providing protection against ballistic missiles, cruise missiles, and long-range bombers. At a minimum, this strategy should

- explain the objectives of the ADI and SDI programs,
- identify the combined ADI and SDI systems needed to meet the objectives,
- provide information on the total cost and schedule for acquiring this protection, and
- explain how DOD would manage the programs to ensure a coordinated and balanced approach between the two programs.

Matter for Congressional Consideration

To ensure that a cost-effective combination of SDI and ADI systems is developed, the Congress may wish to consider requiring DOD to provide the strategy before full-scale development funds are obligated for any system for SDIO's GPALS concept, other than the missile upgrade for the operational Patriot.

Agency Comments

DOD generally agreed with the information contained in our draft report, but it did not fully concur with our conclusions and recommendations because it interpreted them as if we had asserted that the ADI and SDI systems must be deployed simultaneously to be useful (see app. II). DOD acknowledged that both air and ballistic missile defenses are required to provide comprehensive protection to a population or our deployed

forces. However, DOD maintained that earlier development of SDI relative to ADI is reasonable because ballistic missiles are an existing worldwide threat and our current air defense capabilities will provide a measure of protection against current cruise missile threats. More research and technological development is needed, according to DOD, to cope with stealth cruise missiles expected around the year 2000.

Our draft report neither intended to nor explicitly or implicitly asserted that simultaneous deployment of the two systems was necessary. Our position is that the two systems should be developed under a comprehensive and coordinated strategy.

DOD also objected to our recommendation in the draft report that the strategy be reported to the Congress before DOD requests funding for full-scale development and procurement of several GPALS systems, which will be in January 1992. DOD stated that the timely development of more capable anti-ballistic missile systems is essential in the near term and must proceed as expeditiously as possible.

To dispel any fear that money will not be available when DOD is ready to go to full-scale development, we changed our recommendation to read that the strategy be provided before full-scale development funds for any system are obligated. Since the first contract is scheduled for award no earlier than the third quarter of fiscal year 1993, DOD will have a minimum of 20 months in which to prepare and deliver its strategy for comprehensive protection. We believe that the 20-month period is sufficient time to prepare the strategy without delaying the SDI program. Moreover, because DOD disagreed with the recommendation in the draft report, we have made it a matter for congressional consideration for inclusion in fiscal year 1992 appropriations language.

Scope and Methodology

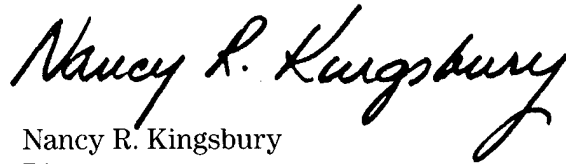
We interviewed officials from the Office of the Secretary of Defense and reviewed management studies and records, including budget information, at the Department of Defense, Washington, D.C. Our review was limited to developing information on ADI's budget and management structure. We did not evaluate the overall effectiveness of ADI or the individual ADI technologies.

We conducted our review between August 1990 and May 1991 in accordance with generally accepted government auditing standards.

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from its issue date. At that time we will send copies to the Chairmen, House and Senate Committees on Appropriations and on Armed Services; the Secretary of Defense; and the Director, Office of Management and Budget. We will also make copies available to others.

Please contact me on (202) 275-4268 if you or your staff have any questions concerning this report. Major contributors to this report are listed in appendix III.

Sincerely yours,

A handwritten signature in black ink that reads "Nancy R. Kingsbury". The signature is written in a cursive, flowing style.

Nancy R. Kingsbury
Director
Air Force Issues

ADI Program Funding and Priorities for Fiscal Years 1991 Through 1997

Dollars in millions

Priority	Program	Fiscal year							Total
		1991	1992	1993	1994	1995	1996	1997	
1	Antisubmarine warfare	\$25.0	\$41.0	\$44.0	\$42.0	\$40.0	\$35.0	\$35.0	\$262.0
2	Special access required projects	55.0	125.0	153.1	132.5	104.7	51.8	23.7	645.8
3	Air Force integration and Army technology	12.4	14.0	14.0	14.0	14.0	14.0	13.0	95.4
4	Office of the Secretary of Defense management	14.3 ^a	4.0	4.0	4.0	4.0	4.0	4.0	38.3
5	Integrated testing	0.0	0.0	0.0	0.5	7.0	37.5	55.3	100.3
6	Advanced technology	0.0	0.0	0.0	0.2	3.5	18.5	27.2	49.4
7	Airship	20.0	54.0	41.0	44.0	30.0	30.0	15.0	234.0
8	Air Force integration, BM/C3, ^b and engagement	5.3	14.6	13.9	32.2	36.2	31.7	37.2	171.1
9	Advanced over-the-horizon	5.0	16.0	45.0	52.0	77.0	62.0	30.0	287.0
10	Airborne sensor technology demonstration and Air Force surveillance	8.8	0.0	0.0	58.0	76.0	86.0	76.0	304.8
11	Integrated testing	0.0	0.0	0.6	0.6	7.0	37.5	55.3	100.9
12	Advanced technology	0.0	0.0	0.4	0.2	3.5	18.5	27.2	49.9
	Small business innovation research program	2.2	4.0	0.0	0.0	0.0	0.0	0.0	6.2
Total		\$148.0	\$272.6	\$316.0	\$380.2	\$402.9	\$426.5	\$398.9	\$2,345.1

Note: Totals may not add due to rounding.

^aThis figure includes an \$8 million payback to fiscal year 1990.^bBattle management and command, control, and communications.

Comments From the Department of Defense



OFFICE OF THE DIRECTOR OF
DEFENSE RESEARCH AND ENGINEERING

WASHINGTON, DC 20301-3030

29 AUG 1991

Mr. Frank C. Conahan
Assistant Comptroller General
National Security and
International Affairs Division
Washington, D.C. 20548

Dear Mr. Conahan:

This is the Department of Defense response to the General Accounting Office (GAO) Draft Report "DEFENSE AGAINST NUCLEAR WEAPONS: Coordinated Strategy Needed Between SDI and Air Defense Initiative," dated August 14, 1991 (GAO Code 392588/OSD Case 8803). The DoD partially concurs with the findings and the first recommendation and nonconcurs with the second recommendation.

The report addresses the relationship that exists between the Air Defense and Strategic Defense Initiative Programs. The GAO accurately captures the changing focus of the Air Defense Initiative, in response to the Strategic Defense Initiative recent change in focus to protection. In the few months that have elapsed since the President directed the change, the Department has devoted significant attention to assuring that the two programs are appropriately coordinated.

There is no doubt that the Congress is entitled to the most current information available concerning our missile defense strategy, as well as the best cost estimates possible. However, ballistic missile defense development must proceed expeditiously. Theater ballistic missiles are an immediate threat to our deployed forces. While the current investment strategy does not provide for concurrent deployment of advanced air and ballistic missile defense systems, it reflects a balanced approach that is intent on fielding capable systems to meet threats as they emerge.

The detailed DoD comments on the report findings and recommendations are provided in the enclosure. The DoD appreciates the opportunity to comment on the draft report.

Sincerely,

A handwritten signature in cursive script, reading "George R. Schneiter".

George R. Schneiter
Deputy Director
Defense Research & Engineering
(Strategic & Theater Nuclear
Forces)

Enclosure

GAO DRAFT REPORT - DATED AUGUST 14, 1991
(GAO CODE 392588) OSD CASE 8803

"DEFENSE AGAINST NUCLEAR WEAPONS: COORDINATED
STRATEGY NEEDED BETWEEN SDI AND AIR DEFENSE INITIATIVE"

DEPARTMENT OF DEFENSE COMMENTS

* * * * *

FINDING A: Evolution and Focus of The Air Defense Initiative and Strategic Defense Initiative Programs. The GAO reported that, in 1983, the President ordered creation of the Strategic Defense Initiative program to counter the threat of Soviet intercontinental ballistic missiles and submarine launched ballistic missiles. The GAO further reported that, in 1985, the President ordered the creation of the Air Defense Initiative program to address the threat posed by Soviet cruise missiles delivered by long-range bombers and submarines, as well as long-range bombers carrying gravity bombs and short-range attack missiles.

The GAO also reported that, in January 1991, as a result of recent changes in the Soviet threat, the President announced the refocus of the Strategic Defense Initiative program -- from deterrence against a massive Soviet attack alone, to protection against accidental or unauthorized attack by ballistic missiles from any geographic location. The GAO found that, in accordance with the new direction, the former Strategic Defense Initiative architecture has been replaced with a new architecture called Global Protection Against Limited Strikes. In addition, the GAO found that the DoD is refocusing the Air Defense Initiative to provide similar protection against Soviet systems the Strategic Defense Initiative does not address. The GAO reported that, according to the DoD, if the U.S. decides a comprehensive limited protection is needed, a combination of both systems would be needed. (pp. 1-5/GAO Draft Report)

DoD Response: Partially concur. The President clearly articulated the nation's strategy with respect to missile defenses. He said, "Looking forward, I have directed that the SDI Program be refocused on providing protection from limited ballistic missile strikes, whatever their source. Let us pursue a SDI program that can deal with any future threat to the United States, to our forces overseas, and to our friends and allies."

In his "Annual Report," the Secretary of Defense elaborated, "The initial objective of a defense deployment is to protect U.S. forces deployed overseas, U.S. power projection forces, U.S. friends and allies, as well as the United States itself from accidental, unauthorized, and/or limited ballistic missile strikes."

While weapons of mass destruction clearly present the most ominous threat, the defenses contemplated are not limited to protection against nuclear weapons. Chemical, biological, and conventional warheads also threaten U.S. deployed forces, friends, and allies.

Now on pp. 1-4.

The GAO asserts that defenses against ballistic missile and air-breathing threats must be deployed simultaneously to be useful; that assertion is incorrect. The Global Protection Against Limited Strikes system and systems deployed as a result of research conducted by the Air Defense Initiative Program will counter two distinct sets of threats. Comprehensive protection against both threats is needed eventually, but protection against either threat alone would be useful. Consequently, a Global Protection Against Limited Strikes deployment that occurs in advance of Air Defense Initiative deployments would provide useful defense against the growing (and immediate) threat posed by the proliferation of ballistic missiles within the third world.

FINDING B: Expected Changes In The Missile Threat. The GAO explained that, until recently, the Soviet nuclear weapons threat against the continental U.S. was the primary focus of both the Air Defense Initiative and Strategic Defense Initiative Programs. The GAO found, however, that the current number of nuclear warheads on strategic missile delivery systems comprising the threat differs significantly from the number proposed in the late 1990s, when both of the U.S. programs are scheduled to reach full-scale development and production. The GAO explained that development of cruise missiles occurred after that of ballistic systems, and currently represent only a small portion of the Soviet arsenal. The GAO observed that the number of Soviet cruise missiles, bombs, and short-range attack missiles is expected to increase from the current 13 percent to 39 percent of the total.

The GAO reported, that in addition to accidental or unauthorized launches of Soviet ballistic missiles, the current Strategic Defense Initiative Global Protection System is being designed to counter tactical and theater ballistic missiles. According to the GAO, threat estimates indicate that by the year 2000, at least 24 nations will possess ballistic missiles, nine of which will have or be near acquiring nuclear capabilities. (pp. 3-5/GAO Draft Report)

DoD Response: Concur.

FINDING C: An Architecture for the Air Defense Initiative Has Not Been Developed. The GAO reported that four architecture contracts, completed in 1988 and totaling \$3.6 million, produced a number of potential architectures for the Air Defense Initiative. The GAO found that, although the DoD planned to pick a baseline architecture in 1989, it did not do so.

According to the GAO, program officials said that both strategic and theater uses for the Air Defense Initiative are being explored, with the intent of focusing the Initiative research and development on technologies that are consistent with the Global Protection Against Limited Strikes concept. The GAO reported that an initial architecture for the refocused program is planned, but a completion date has not yet been identified. In addition, the GAO reported that program officials said they plan to address issues concerning the integration of both the Air and Strategic Defense concepts. The GAO noted that the Strategic Defense Initiative does not

Now on pp. 4-5.

plan to address the cruise missile threat. The GAO observed that recent policy decisions to provide the U.S. protection against limited strikes, together with projected threat changes, suggest the Air and Strategic Defense Initiatives would be closely linked. The GAO concluded, however, that the two programs appear to be proceeding independently. (p. 3, pp. 5-6/ GAO Draft Report)

DoD Response: Partially concur. The DoD completed a series of studies in 1988, which were intended to identify an air defense architecture to complement the near leak-proof strategic defenses initially contemplated by the Strategic Defense Initiative Organization. The studies developed proposals for air defense architectures that were judged to be unaffordable: it was determined large deployments of radars and interceptors were required to counter the emerging stealthy cruise missile threat. Thus, the 1988 studies served to highlight the need for research and development of counter-stealth technologies, which is the current program focus. As the counter-stealth technologies mature, the DoD will complete the analysis necessary to assure that cost and operationally effective Air Defense Initiative architectures are fielded.

Air and ballistic missile defenses must be integrated in support of both the strategic and theater applications that are envisioned. Current studies indicate that there are some synergies between air and ballistic missile defense systems, particularly with respect to the near-term threat. The Department is exploiting the possibilities as much as possible. Future threats provide a much greater technical challenge. For example, there is apparently no common interceptor capable of simultaneously satisfying the full spectrum of ballistic missile and air-breathing defense requirements; however, common command and control, surveillance, and basic research requirements will continue to exist. Additionally, the Air Defense Initiative and Strategic Defense Initiative will continue to explore jointly technical similarities that will contribute to continued cost and operational effectiveness improvements.

FINDING D: Funding for the Air Defense and Strategic Defense Initiatives Differs Significantly. The GAO reported that, since they were first established, the DoD received approximately \$538.6 million and \$20.9 billion, respectively, for research and development on the Air Defense and Strategic Defense Initiatives. The GAO reported that the FY 1992 and FY 1993 budget request for the Air Defense Initiative totalled \$589 million, while the Strategic Defense Initiative totalled \$9.5 billion for the same period of time. The GAO pointed out, however, that until the Air Defense Initiative can estimate the costs of developing and acquiring needed systems based on a system architecture, it is impossible to determine how much additional funding is needed. The GAO noted that a new program plan for the Air Defense Initiative was reviewed in February 1991, covering FY 1991 through FY 1997. According to the GAO, the new plan prioritizes projects, but does not include funding for full-scale development or production -- since those efforts will be the responsibility of the appropriate Military Service.

The GAO also reported that the Future Years Defense Plan for FY 1994 through FY 1997 contains \$30 billion for the Strategic Defense Initiative, but no funding for the Air Defense Initiative. According to the GAO, the DoD informed the Congress that it plans to transfer sufficient funds from other DoD programs to fund

Now on pp. 5-6.

the Air Defense Initiative program. The GAO pointed out, however, that none of the Services have budgeted resources for future engineering and manufacturing development and production efforts. The GAO concluded that the funding differences between the two programs indicate that the Air Defense Initiative will fall further behind the Strategic Defense Initiative in the coming years. (p. 3, pp. 6-7/GAO Draft Report)

DoD Response: Partially concur. The funding profiles of the two programs differ substantially, reflecting the DoD focus on early deployment of defenses against the threat to which we are currently most vulnerable: ballistic missiles. Nonetheless, the DoD is pursuing air and strategic defense programs that will be integrated fully when deployed, and will be funded adequately, consistent with overall priorities.

FINDING E: Development Plans for the Air Defense and Strategic Defense Initiatives. The GAO observed that, as currently planned, the Strategic Defense Initiative will develop at a much faster pace than will the Air Defense Initiative. According to the GAO, since the ADI program will be comprised of different systems, the DoD anticipates the various systems will need to be approved separately for demonstration and validation. The GAO found that approval for engineering and manufacturing development is planned for the middle to late 1990s, when initial systems and technologies selected for engineering and manufacturing development will be managed by the Services.

The GAO found, however, that in comparison, the Strategic Defense Initiative will proceed at a much faster pace for its Global Protection Against Limited Strikes systems. The GAO reported that funding for engineering and manufacturing development of several Strategic Defense Systems has been requested for FY 1992 and FY 1993, while a request for FY 1995 funding is planned for engineering and manufacturing development of the Brilliant Pebbles and ground-based defense of the U.S. segments.

The GAO concluded that, since both the Air Defense and the Strategic Defense Initiatives are focused on providing protection, both systems would be necessary if the Congress decides such comprehensive protection is needed. The GAO pointed out, however, that as currently planned, the two programs appear to be proceeding independently and on different schedules. The GAO further concluded that because the programs are now closely linked, a coordinated strategy is needed between the Strategic Defense and Air Defense Initiatives. (p. 1, p.3, pp. 7-8/GAO Draft Report)

DoD Response: Partially concur. Both air and ballistic missile defenses are required to provide comprehensive protection to a population or to deployed forces. Current air defense capabilities will provide a measure of protection against the current cruise missile/aerodynamic threat. After the year 2000, Air Defense Initiative technologies will be necessary to detect and engage stealthy cruise missiles that might be launched (1) by accident, (2) in an unauthorized raid, or (3) intentionally by a third world nation. Ballistic missiles, on the other hand, are an existing worldwide threat against which the U.S. remains relatively defenseless.

Now on pp. 1, 2-3, 6-7.

* * * * *

RECOMMENDATIONS

RECOMMENDATION 1: The GAO recommended that the Department of Defense provide the Congress with its recommendation for a strategy for providing protection against ballistic missiles, cruise missiles, and long-range bombers. According to the GAO, at a minimum, this strategy should:

- explain the objectives of the Air Defense Initiative and Strategic Defense Initiative programs;
- identify the combined Air Defense and Strategic Defense Systems needed to meet the objectives;
- provide information on the total cost and schedule for acquiring this protection; and
- explain how the DoD would manage the programs to assure a coordinated and balanced approach between the two programs. (p. 8/GAO Draft Report)

DoD Response: Partially concur. The DoD concurs that the Congress clearly is entitled to knowledge concerning the Departmental strategy for implementing missile defenses, as well as the best current estimate of the cost of achieving that protection. The Congress must recognize, however, that the research and development being undertaken push the limits on technology. Many of these efforts involve risk, and there is intentional redundancy in some of the research efforts to minimize technical risk exposure. Those factors complicate the process of estimating the "total cost" of defense. The "best" architecture(s) in 1991 must remain flexible enough to accommodate the constantly changing world situation, as well as to integrate new technologies that may possess significant cost and/or performance benefits.

The separation of the two programs and the differing schedules reflect the DoD commitment to pursuing a "balanced" overall investment strategy for each program threat of interest. Balanced investment requires that the Department focus its limited resources on developing the technologies and systems necessary to defeat a threat when that threat is projected to appear. It does not, in this instance, call for concurrent deployment of Air Defense Initiative and Strategic Defense Initiative systems.

Now on p. 7.

RECOMMENDATION 2: To ensure a cost-effective combination of Strategic Defense and Air Defense Initiative systems are developed, the GAO recommended that the DoD provide the strategy before it requests funding for full-scale development of any system for the Strategic Defense Initiative Global Protection Against Limited Strikes concept, other than the missile upgrade for the operational Patriot System. (p. 8/GAO Draft Report)

DoD Response: Nonconcur. The timely development of more capable anti-ballistic missile systems is absolutely essential in the near term. In a recent speech, Secretary Cheney pointed out the immediacy of U.S. needs, focusing on theater requirements. He said, "The Patriot worked extremely well, but if you'll notice we intercepted those incoming Scuds usually right over the targets that they were headed to. As good as the Patriot is, it's not good enough to reach high and deep to take out the Scuds before they get close to their targets. If Saddam Hussein had fielded warheads other than the kind of conventional warheads that we were faced with, if he'd had biological weapons, or nuclear weapons on those Scuds, we would have had a far greater problem, given the lateness we intercepted them with the Patriot."

Additionally, an air defense infrastructure exists and possesses capability against the air-breathing threat. More capable ballistic missile interceptors could be effectively integrated into the existing air defense infrastructure, similar to the actions taken with Patriot in Southwest Asia.

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Glossary

Air-Launched Cruise Missile	A cruise missile launched from an aircraft, such as a long-range bomber.
Ballistic Missile	A guided vehicle propelled into space by rocket engines. Thrust is terminated at a predesignated time after which the missile's reentry vehicles are released and follow free-falling trajectories toward their ground targets under the influence of gravity. Much of the reentry vehicle's trajectory will be above the atmosphere.
Ballistic Missile Defense	A defense system that is designed to protect against attacking ballistic missiles and usually has several independent layers of defense.
Cruise Missile	A missile with a preprogrammed trajectory that travels within the atmosphere at aircraft speeds and usually at a low altitude. It is capable of achieving high accuracy in striking a distant target. It is maneuverable during flight, is constantly propelled, and therefore does not follow a ballistic trajectory.
Cruise Missile Defense	A defense system that is designed to protect against attacking cruise missiles.
Ground-Launched Cruise Missile	A cruise missile launched from a ground location.
Intercontinental Ballistic Missile	A land-based ballistic missile with a range greater than 5,500 kilometers.
Intermediate-Range Ballistic Missile	A land-based ballistic missile with a range of 1,000 to 5,500 kilometers.
Sea-Launched Cruise Missile	A cruise missile launched from a submarine or surface ship.

**Submarine-Launched
Ballistic Missile**

A ballistic missile launched from a submarine.

Tactical Ballistic Missile

A short range ballistic missile with a range up to about 1,000 kilometers.

Theater Ballistic Missile

A ballistic missile with the same range as an intermediate-range ballistic missile.